



# Fisheries property rights and recreational/commercial conflict: implications of policy developments in Australia and New Zealand

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## Abstract

Commercial fisheries management in Australia and New Zealand is increasingly based on better definition of the rights and responsibilities of resource users. At the same time recreational fishers are claiming a greater share of resources largely based on perceptions of superior economic returns to the community from their activities. The basis of the conflict between traditional, recreational and commercial resource users is moving from physical competition for fish to economic and legal arguments over social priorities. Advantages and disadvantages of increased use of property rights in resource allocation are investigated. It is argued that the recreational sector needs better definition of its claim for priority access to resources. © 2001 Elsevier Science Ltd. All rights reserved.

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## 1. Introduction

“Fishery resources are unusual in the fact of their common property nature, but they are not unique” [1]. All natural resources were once free of property claims. Humans have not always had houses or even permanent shelters. Land was, in the beginning of most societies, considered devoid of ownership. But in 2000 we find that almost all land is claimed by individuals or the state, and land management, including crop and stock production, is dominated by the rights of the owner. Yet fisheries resources, or at least the oceanic ones, have continued to be regarded predominantly as common property. In 1633 Hugo Grotius offered the following explanation “For everyone admits that if a great many persons hunt on land or fish in a river, the forest is easily exhausted of wild animals and the river of fish, but such a contingency is impossible in the case of the sea” [2]. More recently, Scott Gordon observed “unlike fishes, the biotic potential of land animals is low enough for the species to be destroyed” [1]. Unfortunately, the misconception that the ocean’s living resources were immune to human endeavours dominated until recently and prevails in some areas even today.

As the world industrialised and resource harvesting technology improved, common property resources, both terrestrial and aquatic, became progressively overexploited, much in line with Hardin’s “tragedy of the commons” [3]. Hardin’s thesis was based on our inability to deal with the ever escalating pressures of human population growth and the inevitability of open access to valuable, finite resources leading to overexploitation. It is well reviewed by Berkes [4] who highlights Stillman’s [5] conclusion that tragedy is inevitable if the following three conditions occur:

1. the resource is open to any user;
2. users can pursue private gain even against the best interests of the community;
3. the environment is limited such that it is possible for the rate of exploitation to exceed the rate of replenishment.

Most modern fisheries managers have accepted that technological development has left few fisheries immune to condition 3. The failure of society’s conscience to protect common resources in communities of more than a few hundred people [6], and the unacceptably high costs of securing compliance from human populations, has frustrated managers attempts to avoid condition 2. Current fisheries managers have therefore, been forced to progressively rely on restricting access to counter

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condition 1. Restrictions of access have in turn evolved in many cases into allocation of predetermined shares of resources to those ordained as having access. Such allocations have been associated with a variety of rights, responsibilities and tenure.

While the pros and cons of these arrangements for governments and commercial fishers have been the subject of extensive and intensive debate, including voluminous scientific literature, including reviews (see for example [7–9]), their impact, potential or otherwise, on recreational fisheries has been, surprisingly, largely ignored.

## 2. Rights-based management for commercial fisheries

The complementary pressures of increased demand for fish (human population growth, increased appreciation of seafood, including health benefits, and globalisation of markets), increased power of fishing fleets (more, and bigger vessels and ever-improving information and technology) and relatively less effective compliance with conservation imperatives (reduced community conscience, high costs and ineffectiveness of enforcement, increased incentives to exploit, including growing pressures for continuous profits) have led to overexploitation of many of the world's fisheries. Management regimes have, in general, not evolved quickly enough to accommodate change.

The early 20th century saw the development of scientific theory and management practice aimed at describing fishery resource dynamics and controlling exploitation by prescribed inefficiencies in gear, size limits on fish and closed seasons and areas. After about 1950, limitations on access to resources by commercial fishers (limited entry fisheries) increased. However in most cases the inability of management to accommodate industry's increasing ingenuity, preoccupation with short-term profits, and technological development, prevented limited entry from providing protection for resources.

By the 1980s the growing influence of economic rationalism strengthened the supposition that efficient natural resource management in modern society required the allocation of property rights and responsibilities. Under the emerging economic property rights paradigm resources would be secured and economic efficiency obtained when the whole of the resource was allocated in a manner that allowed market forces to dominate. Realisation of the long-term value of sustainable use, and generation of maximum returns from short-term harvest, were to result from the more responsible use, husbandry and protection, of the resource that comes with ownership. The expression of the end product of this economic theory is individual, transferable quotas (ITQs) which in sum account for an assessed total allowable (sustainable) take (catch in the case of fisheries).

Fisheries management literature since the mid-1980s has been dominated by debate of the benefits and problems of ITQ management in a multitude of situations. In the 21st century the debate goes on. ITQs have clearly brought stability and efficiency to many fisheries, but there have been failures. ITQs, with all the associated theoretical and practical advantages, are not a panacea for all commercial fisheries management; they have not as yet been seriously trialed for recreational fisheries management. But successes with commercial fisheries, particularly by comparison with some of the more traditional forms of management, are being acclaimed worldwide and their use seems certain to increase. This increased use for commercial fisheries seems certain to force recreational fishers to respond with their own assertions of property rights.

Human population growth and increased demand for fish has also gained expression through recreational fishing, particularly as increased leisure time and disposable income continue to grow in the developed world. Conflict with the demands of other consumers, usually expressed via commercial fishers, is an inevitable consequence. Thus in 2000 we are faced with

1. the increased long-term rights and responsibilities of commercial fishers as the strengthening basis of commercial fisheries management;
2. growing competition, and associated conflict, between commercial fishers and recreational users (both consumptive and non-consumptive) of fisheries resources;
3. a lack of agreed principles for the allocation of resources (access and use) between competing groups (commercial, customary, subsistence, recreational and non-consumptive);
4. little definition of the rights of non-commercial users;
5. uncertainty over who should be included as recreational fishers [10] and how we assess and evaluate their activities [11].

## 3. The benefits of, and problems with, property rights based management

Many forms of rights have been used in fisheries management over at least the last 100 years. For example the right to use a particular type of gear, to fish in particular areas, or to sell fish. Most of these have been employed in some way in a variety of licensing arrangements. Most are still in operation, and have value, today. It is the bestowing of effective ownership over a pre-determined share (quantity) of the resource (property) to generate increased care and responsibility in resource users that distinguishes individual quota management. But the use of property rights in fisheries management is not limited to ITQs.

Table 1  
Benefits and advantages of ITQs for commercial fisheries management

Benefit to the commercial sector	Comment
Increased profits	Assured of a given quantity of fish each individual can minimise catch costs and plan marketing to maximise returns. Assuming that the sum of the ITQs approximates the sustainable catch that can be taken with the same accuracy as other strategies, long-term profits should exceed those for most other management systems
Greater economic stability	Being able to forecast individual catch levels and to plan the timing of landings should lead to greater stability
Improved product quality	With a known quantity to be landed and time to plan processing and marketing, product quality should increase. The incentive is strong for individuals to maximise their return from their predetermined allocation
Safety	The incentives to fish during dangerous weather or with faulty equipment should be significantly reduced. Opportunity to plan fishing trips more thoroughly should also improve safety
Reduced gear conflicts	In overcapitalised fisheries the fleet size should shrink under ITQ management and effort should become more uniformly spread over the time the resource is available and most valuable. The number of gear types should also reduce as fishers move towards gear which maximises efficiency
Elimination of the race to fish	Reduction in the race to fish should definitely occur
By-catch reduction	If the number of vessels is reduced and the total effort declines, then it can be argued that by-catch can be reduced. However this reduction could be attributed to any mechanism which reduces effort. Furthermore, the increase in high grading which occurs with ITQs could result in increased by-catch for some ITQ systems
Reduced gear losses	This could be expected to occur if total effort is reduced, and/or if the gear which produces fish with the highest profit margin is less likely to be lost than that which takes biggest catches
Improved investment climate	Greater economic stability, the use of shares in the fishery as collateral for loans, and the fact that quota prices reflect the real value of participation in the fishery, should all improve investment
Market gluts are mitigated	An obvious potential benefit from predetermination of total and individual catches
Waste reduction	Producers will have more time to process landings, but if by-catch through high grading is increased then waste may also increase
Wealth	An ITQ is an asset and therefore an expression of wealth (for the individuals who hold quota)
Compensation	Fishers leaving the industry or reducing their participation may be compensated by selling or leasing their quota (note the industry and not Government, normally pays)
Changed culture of fishers	ITQ systems force individuals to be business oriented. Many people originally entered fishing industries because of the lifestyle embodied in hunting and gathering. The competitive nature of many fisheries also carried appeal for some. Conversion to a business culture facilitates the maximising of economic efficiency and planning of marketing strategies
Increased industry involvement in the management process	ITQ systems more directly tie individuals' incomes to the management process. Industry interest in this process increases and problems with the fishery are more quickly identified
Improved industry commitment to resource conservation	The creation of the property right and its allocation to individuals endows those individuals with a saleable commodity which can be regarded as a superannuation benefit. The value of the right is linked to the sustainability of the resource and mitigates against excessive short-term gains which damage the resource's future. Unfortunately, factors such as the need for short-term profits often counteract commitment to long-term resource sustainability
Improved resource assessments	As the value of ITQs is directly linked to the size of the TAC, industry pressure normally results in improved resource assessments. As ITQs tend to increase economic efficiency money available from within the industry to support science can be expected to increase, at least to the extent that industry believes more research is cost effective for them
Facilitation of resource rents	The free trading of quota leads to accurate valuation of shares in the resource and facilitates assessment of a realistic rent. Licensing procedures necessary for implementation of ITQ systems can normally accommodate additional charges and levies with minimal administrative cost
Creation of a mechanism for anglers to displace commercial fishers and vice versa	Provided the holding of quota is not restricted to those actively involved in commercial fishing, angling groups or individuals may buy out commercial operators. Similarly commercial groups may be able to buy anglers' shares

Debate over the many forms of property rights and their associated legal interpretations appears endless. For example Scott points out that the rights of the property holder are determined by the characterisations of the actual property right, and that most property rights can be described in terms of six characteristics: exclusivity, duration, security, transferability, divisibility and flexibility [9]. Palmer correctly reminds us that the definition, and hence value of the right, is a legal issue and no matter what fisheries managers intentions may be it is ultimately

up to the courts to decide the nature and value of the right [12].

The push for increased use of property rights in fisheries management has been intensified by the perceived successes of one form of rights-based management, ITQs, particularly in New Zealand and Australia. The prominence of ITQs in the rights-based management debate is clearly demonstrated by the predominance of ITQ-based discussions at the Fish Rights 99 Conference [13]. It is therefore appropriate to consider the benefits and

Table 2  
Disadvantages of ITQs for commercial fisheries management<sup>a</sup>

Disadvantage to the commercial sector	Comment
High grading	There is clear incentive under ITQs to discard less valuable individuals of any species under quota, but high grading is not peculiar to output controlled fisheries
Under-reporting	ITQs provide clear incentive for under-reporting and misreporting of catches
Enforcement costs and problems	It is generally held that monitoring and enforcement costs are increased under ITQ programmes but there are exceptions. It is also likely that such costs will be reduced over time
Class divisions	ITQs can definitely increase the wealth of individuals who qualify for quota; therefore, they do tend to create “a rich man’s club” <sup>a</sup>
Elimination of small-scale fishermen	This can occur but the degree to which it is a disadvantage needs to be considered on a fishery by fishery basis
Reduced employment and total crew salaries	If total effort is reduced then the total number of crew could be expected to decline. However if profitability goes up the income accrued by individual members may increase
Industry resistance	There is normally an initial resistance to management in any form. Fishers who are to be included in the quota system generally become supportive when they realise the value of a property right. Those who are excluded may never drop their opposition
Inequities	Many argue it is not fair to allocate what has been a common property resource to a few individuals. There are always some who believe they have been disadvantaged no matter how the allocation is carried out
Changed culture of fishers	ITQs change the culture of those in the industry. This could well be undesirable in many situations, for example for lifestyle participants and fisheries of cultural significance such as in isolated Pacific Island communities
Diminished value of catch and effort data bases	The introduction of most new management systems leads to alterations in data requirements. This usually detracts from the comparative value of before and after data as indices of the status of the resource. The incentive to cheat on catch declarations inherent in ITQ management can cause additional problems, particularly if catch data are used in the allocation process
Decreased ability to accommodate seasonal fluctuations in abundance	Abnormally good or bad year classes of fish may be under- or overexploited (respectively). The quota setting mechanism, even if based on resource assessment and not historical catches, will seldom allow precision in predicting harvest for abnormally good or bad years. Fisheries managed by effort controls will see catches more closely reflect good or bad year classes of fish
Creation of part-time fishers	The advantages of ITQs, such as economic efficiency, removal of the race to fish, and increased business skills in the fishing community, lead to many operators working less than a full year. Increased monetary benefits also facilitate the diversification of fishers into other industries, often outside the fishing sector. The positive aspects of this have already been considered. One negative aspect is that those who invest in other industries may use the high cash flow and reliability of income from a quota-managed fishery for day-to-day servicing of their total investment package. When a resource is in decline and total catches should be reduced, individuals may more strenuously oppose such cuts to avoid embarrassment in their alternative interests
The need for precision in sharing resources	Allocation of ITQs gives substance to the determination of a total catch by commercial harvesters (TACC). It necessitates allocation between groups and in turn focuses attention on the rights and responsibilities of individuals within groups. This often requires greater precision, at greater cost, in resource assessment
Management for the status quo	Industry pressure to maintain cash flow and management reluctance to force change often result in resources being kept at a lower, but equilibrium (sustainable), level

<sup>a</sup>Anderson LG. Consideration of the potential use of individual transferable quotas in U.S. fisheries. NOAA Report, vol. 1, Overview Document, 1992. 71pp.

disadvantages of ITQs for commercial fisheries management and then to consider the possible use of similar principles of increased property right for recreational fisheries (Tables 1 and 2). The values listed as benefits and disadvantages in these tables are from two primary sources, the first 13 advantages (Table 1) and 8 disadvantages (Table 2) are modified from work undertaken by Sutinen et al. in 1992 [14], with the remainder compiled by the author.

#### 4. Rights and quota management of recreational fisheries

Recreational fishers share many fisheries resources with commercial harvesters. Therefore, the allocation of a right to all or part of the resource to one group normally impacts the resources available to the other. The nature and magnitude of this impact will depend on the magnitude of the resource, the level of exploitation and the level and method of allocation. Therefore, as

fisheries management moves progressively to total allowable catches (TACs) and to individual allocations for commercial fishers, it is critical for recreational fishers to understand the implications of quota management on their rights and responsibilities. Not only do they need to assess the impact on themselves of increased use of property rights for commercial fishers but also the likely move by governments to at least attempt to apply similar principles to recreational fisheries. It seems inevitable that governments will try to devolve more and more of the responsibilities and costs for resource conservation and management to the user (user pays). This is commonly done under the mantle of increased stakeholder participation and ownership of decisions. In many fisheries management fora, increased paying is associated with increased say in many aspects of management [15]. This again emphasises the necessity for recreational fishers to fully comprehend the total fisheries management process and to have agreed strategic and management plans for their sector.

Even a preliminary consideration of possible benefits and disadvantages of increased use of property rights and possible quota allocation for the non-commercial fisheries sector is quickly faltered by the lack of definition of who comprises the non-commercial sector, what aspects of resource access they value most, and what rights they have. In regimes dominated by the seldom questioned right of access of all individuals to the common aquatic resources few governments saw need to define recreational users. On the other hand, anglers, and many others, considered activities such as observing aquatic habitats and associated species, getting closer to nature and even attempting to catch enough fish to feed one's-self and one's immediate family, to be birth rights. The knowledge that such activities were dear to a large and very vocal group of voters coupled with the common perception that their impact on total aquatic resources was insignificant, relieved governments of the need to seriously regulate, or even investigate. As the world's aquatic resources have progressively shown the stress from anthropogenic pressure of many forms this large group has increasingly called for restrictions on other resource users and impactors. They have also sought more involvement in the management process. These calls have led progressively to actions for aquatic resource and habitat protection and increasingly highlighted the need for accurate assessment of all impacts on resources.

World-wide fisheries managers are accepting that even the oceanic resource base is vulnerable to overexploitation and that restrictions on harvest practices are necessary for resource sustainability and economic efficiency.

The next step for many managers is the allocation of resources between user groups. This again raises the issue of who are the interested parties, what do they do, how much of the resource do they want, or need, and how much of it are they entitled to.

One listing of parties with a direct interest in the conservation and allocation of living aquatic resources [10] is as follows:

1. licensed commercial fishers;
2. unlicensed operators who sell their catch;
3. accumulators, who use large catches as food for extended groups or for barter;
4. competitors, including those to whom the capture of more fish than others is primary;
5. hunters, motivated by the chase and the kill;
6. sportspersons, to whom the challenge, the skill, the odds, the adrenalin rush and the satisfaction of a job well done are important, but so is a feed of fish;
7. recreational enthusiasts, to whom the outing is most important but for whom a feed of fish is still a prize;
8. social fishers, to whom the camaraderie and fellowship are most important;
9. adventurers, who like the hunter savour the chase, but not the kill, and release their catch;
10. lovers of open space, who if they do have a line in the water, do so purely to justify being outdoors;
11. observers, particularly underwater enthusiasts;
12. preservationists, who are there to prevent change.

Estimation of what fraction of the total population is in each of the above categories is seldom available. Indeed many individuals may be in one or more categories one day and others the next. However it is still necessary, and possible, to consider how each of the categories might be impacted by increased use of property allocation in future fisheries management. Such an assessment helps identify issues which may unify, or divide, sections of this diverse group, as they approach new measures for resource conservation and allocation.

Because of the diversity of the 11 non-commercial groups it is more difficult to prescribe what the benefits or disadvantages of management by quota allocation may be. Much will also depend upon the degree to which an allocation to the sector as a whole is translated into individual rights, presumably predominantly in the form of bag limits. However comparison (Tables 3 and 4) with the benefits and disadvantages the commercial sector finds with quota management in the form of ITQs (discussed earlier) highlights issues of likely importance for within sector allocation as well as focusing on why allocations might be made between sectors.

## **5. Use of property rights in the resolution of conflict between commercial and recreational fishers**

Over the last decade or so Australia and New Zealand have received international acclaim for their progressive fisheries management. Much of the perceived excellence has been attributed to the performance of both countries in increased use of property rights (statutory fishing

Table 3  
Relevance to the non-commercial sector of benefits to the commercial sector from ITQ management

Benefit to the commercial sector from ITQ management (from Table 1)	Possible relevance to the 11 components of the non-commercial sector
Increased profits	Only relevant to the first one or two groups who may derive monetary benefit from stability of resources and associated yields
Greater economic stability	Stability of the sector as a whole should increase with stability of resources and reliability of yields
Improved product quality	If there is reallocation within the non-commercial sector to facilitate more but smaller catches, product quality should increase
Improved safety	Not directly relevant
Reduced gear conflict	Gear conflict will increase if management leads to more fishers but a stable share of the same size resource. It will decrease if allocation of the resource results in less fishers
Elimination of race to fish	The race to fish will increase if there are more anglers and the same TAC
Bycatch reduction	The reverse may be true if total effort goes up
Reduced gear losses	Not directly relevant
Improved investment climate	Stability may give the support sector greater confidence
Changed culture	Pressure on those who exceed bag limits should lead to change
Increased involvement in management	Inevitable increase
Improved conservation	Yes if compliance is good
Improved resource assessments	Yes
Facilitate resource rents	Yes as recreational licences become more specific
Anglers may displace commercial fishers	Depends if resource shares are transferable and in what direction

Table 4  
Relevance to the non-commercial sector of disadvantages to the commercial sector from ITQ management

Disadvantages to the commercial sector (from Table 2)	Possible relevance to the 11 components of the non-commercial sector
High grading of catches	With small bag limits this could be a major problem
Under-reporting	(i.e. disregarding bag limits) definitely a problem
Increased enforcement costs	Probably increased. Education will need to be increased
Class divisions	Possible if bag limits become saleable or tradeable
Elimination of small operators	May be relevant if license fees are restrictive
Reduced employment	Total employment in support industries could be expected to increase
Industry resistance	Definitely from some sectors
Inequities	Allocation between recreational and commercial will be opposed by some, as will restrictive allocation within the recreational sector, but in the longer term inequities should be removed
Changed culture	There will likely be a change to the general public perception of the values of recreational fishing. Also, those who currently take the biggest catches may have to change their expectations. There may be more lobbyists
Diminished value of data bases	Not a major problem as only very specific data bases are currently of great value and these need not change
Decreased response to seasonal fluctuations	Will remain a problem unless the science gets precise enough to enable seasonal changes to bag limits
Create part-time fishers	Not relevant
Need precision in resource sharing	Definitely
“Equilibrium” management	A problem but less than for the commercial sector

rights) in fisheries management. The adoption of ITQs in management has been commonly singled out for praise, particularly in New Zealand, even though other forms of increased security of access, such as controlled entry by tradeable licences and gear units, often underpinned successful management, for example in the Australian Commonwealth managed northern prawn fishery [16] and the Western Australian rock lobster fishery [17]. Reported success in both countries and the growing support for increased co-management through progressive use of

property rights for individuals, and devolution of management responsibility to industry, seem certain to result in even greater use of such principles. At the same time, competition between commercial and recreational users of fisheries resources assumes greater proportions. Yet debate over the role of property rights in resolution of this conflict, or even the contribution of increased use of such rights to possible escalation of disagreement, remains scant. Developments in both countries provide examples of the potential dangers of further strengthening of

property rights for the commercial sector without clear definition of the principles underlying resource access and allocation.

### 5.1. Australia

The management of commercial and recreational fisheries in Australia is confused by the varying roles of states and the Commonwealth. States predominantly manage in-shore resources and therefore preside over most issues of direct competition between recreational and commercial fishers. The Commonwealth role in such disputes is largely confined to the offshore tuna and billfish fisheries. However, its role in providing overriding legislation relating to resource use and conservation and for showing leadership (not often acknowledged by States) in management, is significant.

The creation in 1991 of the Australian Fisheries Management Authority (AFMA) was a pivotal development in the role of the commercial fishing industry in fisheries management. It represented devolution of considerable rights and responsibilities from government to industry. McColl and Stevens [18] give seven examples of areas where AFMA's predecessor, the Australian Fisheries Service (a Commonwealth Government department), was not meeting the expectations of government, industry or the public. Significant among their conclusions is "The fisheries portfolio seldom provided political benefits to the party in power." It is difficult to refute the argument that a primary goal of government in creating AFMA was to distance itself from the no-win decisions which had become entrenched in Australia's fisheries management. The offer to industry of increased property rights and responsibility for management was considered necessary to coerce industry into accepting the increased responsibility and associated financial costs.

The achievements of AFMA and the underlying co-management model were reviewed after its first six years and generally favourable conclusions were reached about the resulting standards of industry-scientist consultations, associated resource assessments, and the integrity of AFMA's management decisions [19]. The reviewers quote an inquiry by the Australian Federal Parliament which looked specifically at the dilemma of AFMA's decision-making process potentially being captured by industry. The inquiry concluded "The committee recognises the risks, but believes industry involvement is essential and is undoubtedly an improvement on the previous management approach" [20].

From the perspective of assessment of the use of property rights in Commonwealth fisheries management the Government's undoubted satisfaction is critical. Government representatives have:

1. had to make fewer no-win decisions which previously had been politically damaging;
2. received acclaim for progressive fisheries management;
3. secured industry funding for 52.2% of the total costs of AFMA and constrained the costs to Government of managing fisheries.

The logic which underpinned the creation of AFMA and the resulting increased use of property rights in fisheries management was consistent with economic rationalist views of the time that increased use of market forces and property rights was fundamental to solving resource use and allocation problems. The success of the AFMA model, and the persistence of economic rationalism in the Commonwealth Government, seem certain to ensure property rights based solutions are at least considered for Australia's future commonwealth fisheries management problems.

Australia's states use a wide variety of approaches to fisheries management. Common however, is the increasing priority given to the management of recreational fisheries and the interface with commercial and recreational harvesting and environmental degradation. Most states have accepted the need to control total recreational catch in at least some fisheries. They have done so in the form of bag and size limits for many popular species. The implementation of licenses as part of the management process for marine and estuarine fisheries is relatively new; the most populous states, New South Wales and Victoria, are in the process of introducing such licenses. However these licenses are not intended as a mechanism to regulate entry (effort) or to control catches. Anglers are being required to pay for a license to be seen fishing. The license carries no right to a share of the resource, nor is it tradeable, or have any of the other characteristics of a property right [9]. These licensing systems are primarily revenue-generating mechanisms that in effect require the recreational fishing sector to pay for at least part of the costs of management by governments of its activities. Revenue so generated may be used for resource and/or habitat restoration and enhancement and such possibilities are usually an integral part of Government marketing strategies.

In very few cases in Australian states has a predetermined share of the total resource been allocated to the recreational sector, except where exclusive use of a species is given to that sector. For most fish species in most states the total recreational catch is not even known, let alone assessed against a target limit.

Anglers assume they have as a birthright, access to fish resources. But collectively their rights to, or responsibilities for, a share of these resources have not been defined. There is a non-specified common law right of all individuals to fish in the ocean but this right is being increasingly reduced by statutes, such as the introduction of bag and size limits, which modify activities. The recreational right is also being indirectly eroded by the increased definition by statutes of the rights of commercial fishers.

Individuals still have a right, accepted by governments, to take catches by approved methods every day. For many species these catches are not limited but bag limits do apply for popular species in most states. However, disparity between individual catches (daily and annual) are enormous and yet license fees where they apply are fixed and not related to any individual share of the resource or allocation to the sector as a whole.

In the state of Victoria the recent resolution of disputes between anglers and commercial fishers over resource use provided an interesting example of adjustment to resource use without definition of the rights of either group. Anglers claimed that excessive commercial fishing effort had overexploited fish resources and damaged underlying habitats. The case was made to the government to ban commercial net fishing in Victoria's bays and inlets [21]. Subsequent assessment of the status of fish resources and relative impacts of commercial and recreational fishing [22] and the impact on fisheries of environmental degradation from causes other than fishing [23] led the Victorian Fisheries Co-Management Council to conclude "that continued environmental damage poses far more serious threat to the fisheries of Victoria's bays and inlets than do current commercial or recreational fishing practices" [24].

The economic contributions of both sectors to the economy of Victoria were assessed for the Co-Management Council [25–27]. One reviewer, Hundloe [27], was dismissive of earlier studies which suggested that expenditure on recreational fishing should be used to value that activity (such studies formed the basis of much of the recreational sector's case for increased allocation). The Council accepted a recommendation that based on the available economic data, reallocation of resources from the existing approximately equal catches by commercial and recreational fishers, was not justified [24]. The Council also recommended to Government that latent commercial fishing effort should be removed, with compensation. Government accepted these recommendations and committed the money raised from a new recreational fishing license to pay compensation to a small number of relatively inactive commercial fishers who were retired from the fishery [28]. Both recreational and commercial sectors were reported to be pleased with these outcomes [28].

It is noteworthy that the Victorian Fisheries Co-Management Council's landmark resolution of the longstanding dispute between commercial and recreational fishers was achieved without definition of the rights of either group to resource access or use. However, the decision effectively reaffirmed the rights of seafood consumers to a continued share of inshore species targeted by large numbers of anglers. Debate during the process also highlighted the need for definition of access rights to facilitate management of resource use as human population pressure inevitably increases.

## 5.2. *New Zealand*

New Zealand has chosen to manage its major fisheries, customary, commercial and recreational, by output controls. The watershed event in this process was the introduction of the quota management system (QMS) in 1986.

For each key species in each management area the fisheries Minister sets a total allowable catch (TAC) based on scientific advice on the maximum sustainable level of exploitation. The TAC is then allocated by the Minister to the customary, commercial and recreational sectors. This management and allocation process and in particular, how the rights of the recreational sector are currently accommodated is well reviewed by McMurrin [29].

The customary share is allocated to Māori in two parts; firstly a commercial component in the form of a quota for key species, and secondly, a non-commercial component as an allocation. Both of these rights are covered under the Deed of Settlement legislated in the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 [30].

The commercial share (non-customary) is allocated in well-defined property rights as ITQs. The effectiveness of this ITQ system in managing New Zealand commercial fisheries has been reviewed many times [8].

The recreational share is allocated as a loosely defined allowance. Although this allowance lacks the security of a well-defined and legislatively protected share of the resource, it has historically been set at levels which accommodate the expectations of the sector based on previous years catches. As such it has served recreational resource users and Government well. However as competition for stable or declining resources increases, challenges appear certain to increase.

While the customary and commercial allocations have the best-defined rights, in practice the customary and recreational allocations are normally determined before the commercial share is allocated. Once the recreational allocation is determined the Minister is required to manage the recreational fishery, primarily by way of bag limits, to contain catches within this allocation.

The New Zealand Ministry of Fisheries acknowledges that the rights of recreational fishers are relatively poorly defined, even though by international benchmarks the standard of recreational fisheries, knowledge of catch and effort and the allocation process [29], all appear exemplary. Furthermore, the Ministry is working with the New Zealand Recreational Fishing Council Inc to address the issue of property rights for recreational fishers. Discussion papers for a 2000 conference confirm advanced consideration of the need for, but problems with, defining the recreational right [29,30]. Two key policy objectives have been set:

- "better defining the recreational right by introducing a proportional share arrangement", that is a percent-



age of the TAC which is not varied from year to year at the will of the Minister;

- “enhancing recreational fishers’ rights to directly manage their share”, that is greater involvement of representatives of the recreational sector in the management of recreational fishing practices. Regionally based groups have been proposed for this purpose [29].

It is significant that many New Zealand recreational fishers believe their right to the resource has preference over that of commercial fishers. They cite a 1989 National Policy for Marine Recreational Fisheries which states “Preference will be given to non-commercial fishing in areas readily accessible to and popular with the public, where a species is not sufficiently abundant to support both non-commercial and commercial fishing.” However a number of court cases since 1989 have demonstrated that the Minister is not required to give preference to either recreational or commercial interests [30].

## 6. The basis of alternative allocations

Demand for fish as food and as the basis of recreation seems certain to increase. Governments are becoming increasingly conscious of the need for active measures to conserve aquatic resources for both their intrinsic value as species and as a component of sustainable development. The history of fisheries management suggests that the regulation of catches (output controls) will become the management process of choice for more and more fisheries. Inevitably this will create greater need for accurate determination of maximum sustainable yields, or one of the many variants on this concept [31], and translation of these into total allowable catches. The recent history of fisheries management also suggests that governments will devolve more of the responsibilities and costs of resource management to users, under the principle of user pays. This devolution seems certain to require better-defined property rights for users, probably in the form of quotas. Allocation of rights to those claiming an entitlement to the resource looms as the major issue facing management.

It is known that access to resources will need to be allocated between the major groups, commercial, recreational and customary and even within each. What is not known is what values should underpin decisions on allocation.

The commercial sector increasingly depicts itself as the agent of consumers, the seafood eating public (note for example the change in name from National Fishing Industry Council to the Australian Seafood Industry Council in 1990 and the Victorian Commercial Fishermen’s Association to Seafood Victoria in 1999). The effect is to strengthen their right to the resource by representing the

91–92% of the Australian population who eat seafood at least once a year [32].

The right of the non-commercial sector is not well defined. This is not surprising as the sector itself is difficult to describe. In Australia between 4.8 [33] and 30% [34,21] of the population are anglers (participate at least once a year). No single definition, nor suite of definitions, of why they value this pastime and hence access to fish resources, is available [35]. Their right of access to the resource is assumed but not defined. Only in New Zealand is a share of the harvest actually allocated and even that is done loosely. Anglers in particular are advocating decreased commercial access to resources on the presumption that such action will improve the quality of angling. Arguments to support the community benefits from such action have to date been based primarily on imprecise statistics and flawed economics [35].

The dilemma now facing managers is that the resource will need to be allocated to competing users but no principles have been established for allocation. Economic rationalism drives many government agendas and has heavily influenced modern fisheries management, arguably to the good. Many estimates of economic returns to society in Australia from angling [36] have to date been confounded by incorrect assumptions about the value of expenditure as an indicator of economic worth [27,35]. There is currently no accepted method for evaluating recreational fisheries, yet arguments for an increased share of the resource, in recognition of its importance, abound. It has been argued that the major values of recreational fisheries are social [35]. Economic rationalism does not well accommodate social issues [37] and often neglects the social benefits of resource re-allocation [38].

As the results of growing pressure on aquatic resources become more obvious anglers are becoming more conservation conscious. Increased catch and release is one obvious manifestation. How to accommodate potentially increased access with supposedly decreased impact on the underlying resource is but one of the conservation and allocation issues. Do non-consumptive users deserve preferential access? Does catch and release qualify as non-consumptive use when the intention (insignificant mortality or changes to population behaviour) does not always equate with the outcome? The justification of such use is also being questioned by animal rights activists with growing pressure on many angling practices, including catch and release [39,40]. Definition of the rights of access to resources seems certain to become confounded by the responsibilities of those who have access. The multiplicity of interests of those in the non-commercial category further complicates definition.

The rights of customary users of resources are commonly more specifically defined in historical agreements, treaties and/or the legal interpretations of customary

rights.<sup>1,2</sup> How these rights are accommodated in allocation is not so clear. Should they be related to the total amount of resources that existed in times of traditional societies, or to a share of what is left? Or should concern for inter-generational equity, for customary or alternative users, further restrict current harvests?

## 7. Conclusions

Increased recognition of rights and devolution of responsibilities to resource user groups appears inevitable in future fisheries management. Allocation between competing user groups will be influenced by arguments over the nature of the right. This, in turn, will be affected by the rationale for the right.

Customary and commercial sectors have well-defined rights in many fisheries and in others the rationale supporting such rights is defined, even if not fully accepted by all parties.

The rights of non-commercial, non-customary resource users are not well defined, even though many citizens assume access to supposedly common property resources is a birthright. Anglers enjoy preferential, and even exclusive, access to some resources but their security is being threatened by diverse interests, including animal rights activists, commercial fishers representing seafood consumers, and conservationists advocating increased exclusion zones (protected areas).

The diversity of interests in the non-commercial sector complicates definition of rights. Without such definition it is difficult to evaluate economically or socially the activities, singly or collectively. While this uncertainty exists the rights of other resource users are increasing, if only by the precedent of their use in management. It appears anglers have little choice but to join the property rights race. Present reluctance appears a result of the difficulties in defining who they are and why they should be given rights.

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<sup>1</sup> Treaty of Waitangi (Fisheries Claims) Settlement Act, 1992, New Zealand.

<sup>2</sup> Mabo versus Queensland, 1992, Australia.

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